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10/550,281	01/25/2007	Erhard Affolter	1867-0114	5769
28/078 7590 09/16/2009 MAGINOT, MOORE & BECK, LLP CHASE TOWER 111 MONUMENT CIRCLE SUITE 3250 INDIANAPOLIS, IN 46204				
EXAMINER				
COX, ALEXIS K				
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3744				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/550,281

**Applicant(s)**

AFFOLTER ET AL.

**Examiner**

ALEXIS K. COX

**Art Unit**

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF-08)  
Paper No(s)/Mail Date 2/05/2007
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the reference resistor in parallel with a temperature sensor resistor must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claims 20-22 and 24-33 are objected to because of the following informalities:

3. Regarding claims 20-22, the term "a measurement signal" appears to refer to the same signal as the "temperature signal" of claim 17, when reading the claims in light of the specification. Accordingly, this is the way in which it has been treated for the purpose of examination.

Regarding claim 24, the term "at least one measurement sensor" on line 4 should be changed to "the at least one measurement sensor" to increase the clarity of the claims.

Further, throughout the claims, the first recitation of an element should be preceded by "a" or "an" and all subsequent recitations should be preceded by "the" or "said." Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 17-18 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Harding (US Patent No. 4,599,992).

Regarding claims 17 and 24, Harding discloses an apparatus for temperature regulation/limitation of a heat generating installation, comprising a first measurement sensor (30, see column 4 line 41), a regulator operatively connected to the first measurement sensor (28, see column 4 lines 14-17); an automatic heating system including a safety module (45, see column 5 lines 59-63) that stores a maximum

permissible safe temperature value (Storage Tank Switch High High, also STSHH, see column 4 lines 23-30 and column 5 lines 47-49), the first measurement sensor detects a temperature and transmits a corresponding temperature signal to the regulator (see line between sensor 30 and thermostat 28), the regulator receives the temperature signal and transmits a corresponding temperature indication to the automatic heating system via a communication interface (line between thermostat 28 and burner 10) which is operatively connecting the automatic heating system to the regulator, the safety modules compares the temperature indication to the maximum permissible safe temperature value and the switch-off signal causes the automatic heating system to switch off the heat generating installation (45, STSHH, see column 5 lines 59-63 and column 4 lines 47-49).

Regarding claim 18, the apparatus of Harding further comprises a second measurement sensor (temperature sensor portion of tank thermostat 28, see figure 1) operatively connected to the regulator.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
9. Claims 19-21, 25-27, and 32-33 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Harding (US Patent No. 4,599,992) in view of Tazawa et al (European Patent Application No. 0259012).

Regarding claim 19, it is noted that Harding does not explicitly declare what sort of wiring is involved in the temperature sensors. Tazawa et al explicitly discloses the use of a reference resistor in parallel with a temperature sensor resistor (see abstract lines 9-13) with a switching module which switches between various sensors and the reference resistor. It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to perform the simple substitution of the exact arrangement of temperature sensing resistor in parallel with a reference resistor of Tazawa et al for the unspecified sensor of Harding in order to have a common and inexpensive but

reliable sensor in use. It would further have been obvious to one of ordinary skill in the art at the time of the invention for the automatic heating system to control switching between the measurement sensor resistance and the reference resistance, as the automatic heating system uses the comparison of the values generated to determine if the system has overheated or not.

Regarding claim 20, it is noted that Harding does not explicitly disclose the presence of a test requirement unit configured to transmit a test requirement signal to the sensor value/test value switching module, and the sensor value/test value switching module to be configured to transmit a test value derived from the reference resistance to the automatic heating system via the communication interface in response to the test requirement signal. Harding fails to disclose this because Harding does not explicitly disclose any particular sensor. The presence of a reference resistance is for the purpose of permitting a test value, or a reference value, and the switching between sensor resistance and test resistance (first, second, and third switching means, see page 4 lines 8-17) will be controlled by the automatic heating system via the communication interface, as a result of a test requirement unit transmitting a test requirement signal, as otherwise it would not fulfill the purpose of a reference resistance as a basis of comparison to determine if a given temperature condition had been met. Further, this switching would not take place without a test requirement unit to cause the test or reference value to be generated.

Regarding claim 21, the regulator (thermostat 28 of Harding) processes at least one of a measurement value derived from the measurement sensor resistance and the

test value before the regulator transmits the at least one of the measurement value and the test value to the automatic heating system via the communication interface, because this is what thermostats do, and if it did not do so it would not be a thermostat.

Regarding claims 32 and 33, the method steps of transmitting sensor and test values as a data message periodically and automatically and transmitting sensor and test values asynchronously are equivalent, obvious substitutions for the unspecified data transmission method of Harding in view of Tazawa et al, and as such would have been obvious to one of ordinary skill in the art at the time of the invention as potential data transmission modes when implementing the system of Harding in view of Tazawa et al which would result in effective and inexpensive communication between system parts.

10. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harding (US Patent No. 4,599,992).

Regarding claims 25 and 27, it is noted that Harding does not explicitly disclose the presence of a test requirement unit configured to transmit a test requirement signal to the sensor value/test value switching module, and the sensor value/test value switching module to be configured to transmit a test value derived from the reference resistance to the automatic heating system via the communication interface in response to the test requirement signal. Harding fails to disclose this because Harding does not explicitly disclose any particular sensor. The presence of a reference resistance is for the purpose of permitting a test value, or a reference value, and the switching between sensor resistance and test resistance (first, second, and third switching means, see



page 4 lines 8-17) will be controlled by the automatic heating system via the communication interface, as a result of a test requirement unit transmitting a test requirement signal, as otherwise it would not fulfill the purpose of a reference resistance as a basis of comparison to determine if a given temperature condition had been met. Further, this switching would not take place without a test requirement unit to cause the test or reference value to be generated.

Regarding claim 26, without the provision of a specific attribute for the response to the test requirement, the processing of the response would not be possible, and therefore this limitation is met by the system of Harding, as shown above.

11. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harding (US Patent No. 4,599,992) in view of Tazawa et al (European Patent Application No. 0259012) further in view of Nolan et al (US Patent No. 5,619,430).

Regarding claim 22, it is noted that Harding and Tazawa et al do not explicitly disclose the use of a multiplexer, and analog/digital converter, a shift register, and a linearization module, all of which are operatively connected to provide for further processing of the at least one of measurement and test values. Nolan et al explicitly discloses the use of a switch (140, 142, see column 12 lines 5-16), a multiplexer (mux, 32, see column 6 lines 15-20), an A/D converter (30, see column 6 lines 15-16), and a shift register (303, see column 19 line 21), all operatively connected and providing for processing of a measurement value. As these elements, combined, simply form the structure and method of data processing and transmission in an interchangeable way with others, both claimed elsewhere in the present application and commonly present in

the art, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the structure of Nolan et al for the unspecified structure of Harding and Tazawa et al in order to have a standard and effective mode of data transmission.

12. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harding (US Patent No. 4,599,992) in view of Nolan et al (US Patent No. 5,619,430).

Regarding claim 23, it is noted that Harding et al does not explicitly disclose the communication interface to be at least one of a data bus or a radio link, or for each thermostat of Harding to have a microcontroller. As standard modern thermostats come with microcontrollers for ease in setting preferred temperatures, especially for setback and other efficiency temperature measures, it falls within the realm of common knowledge as an obvious mechanical expedient to include microcontrollers in the thermostats of Harding et al. Nolan et al explicitly discloses the use of a data bus for communication between microcontrollers (10, 58, see column 18 lines 9-16). It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use the data bus of Nolan et al in place of the present but unspecified communication interface of Harding in order to have a standard part in use as communications interface, making both designing future added equipment and maintaining what is already present less expensive and time consuming.

13. Claims 28-30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Harding (US Patent No. 4,599,992) in view of Tazawa et al (European Patent Application No. 0259012), in view of Ballard (US Patent No. 1,963,771).

Regarding claim 28, it is noted that Harding in view of Tazawa et al does not explicitly disclose the locking of a burner after a time delay via the automatic heating system if a comparison between a reference value and the test values does not correspond to an expected value, if a fault message is generated, if a lack of the response to the test requirement signal indicates a failure of at least one of the measurement sensor resistance/reference resistance and the regulator, and if the lack of the response to the test requirement indicates a communication fault. Ballard explicitly discloses it to be common and known in the art to control a burner so that it is locked off when a reference value and a test value do not correspond appropriately (see page 1 lines 5-15), or for any sort of fault or failure of the system (see page 1 lines 12-15), and to do so according to a time delay ("for a definite interval", see page 1 line 10). Indeed, Ballard even has first and second measurement sensors (17, 19, see figure 1) operatively connected to an automatic heating system. It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to program the controller of Harding in view of Tazawa et al to control the boiler in accordance with the method described by Ballard in order to prevent damage to the boiler and unnecessary cycling of the boiler.

Regarding claims 29 and 30, it is noted that Harding and Tazawa et al do not disclose separate steps of initiating a safety switch-off when the received measurement values first exceed the maximum permissible temperature difference and locking the burner if the received measurement values again exceed the maximum permissible temperature difference within a specific time after the received measurement values first

exceed the maximum permissible temperature difference, and incrementing a counter when the maximum possible permissible safe temperature is exceeded as a result of subsequent heating effect after a burner has been switched off.

Further regarding claim 30, the applicant is reminded that a recitation of the manner in which an apparatus is intended to be used does not cause it to be distinguishable over an apparatus which meets the structural limitations of the claims. As long as an apparatus increments a counter when the maximum permissible safe temperature is exceeded and locks the burner, the cause of exceeding the maximum Permissible safe temperature is not required to be present.

14. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harding (US Patent No. 4,599,992) in view of Tazawa et al (European Patent Application No. 0259012), in view of Graves et al (US Patent No. 2,966,940).

Regarding claim 31, it is noted that Harding and Tazawa et al do not explicitly disclose limiting unlocking operations via the communication interface to a maximum number of unlocking operations within a defined time period. Graves et al explicitly indicates the commonality of limiting unlocking operations within a defined time period (see column 2 lines 1-2 and 17-27). It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to program the controllers of the system of Harding and Tazawa et al to prevent nuisance burner cycles by limiting the number of unlocking operations within a given time period.

15. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harding (US Patent No. 4,599,992) in view of Tazawa et al (European Patent Application No.

0259012), in view of Feldmeth et al (US Patent Application Publication No. 2004/0112970).

Regarding claim 31, it is noted that Harding and Tazawa et al do not explicitly disclose limiting the number of times the burner may be unlocked to a maximum per time period. Feldmeth et al explicitly discloses this feature (see paragraph [0015]). It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to program the controllers of Harding and Tazawa et al to lock the burner if excessive cycles took place, in order to prevent unnecessary wear and tear on the equipment.

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Thomson (US Patent No. 822,323) discloses thermostatic burner control, as does Ellis (US Patent No. 1,735,268). Tyler (US Patent No. 3,880,353) discloses a heating system with safety valve that is additional to normal cyclic control of the heater. Heeger (US Patent No. 3,948,439) discloses a sediment buildup warning device for water heaters. Lesage (US Patent Application Publication No. 2003/0150404) discloses an explosion resistant gas fired water heater. Kemp et al (US Patent Application Publication No. 2005/0224016) also discloses a steam boiler safety sensor. Swindle (US Patent No. 4,467,178) discloses anticipatory water heater operation. Bartok et al (US Patent No. 4,535,931) discloses a water heater with the difference between temperatures sensed determining the safety cut-off's application. Adams et al (US Patent NO. 4,923,117) discloses redundant sensor input into a microcomputer

controlled heater. Weiner (US Patent No. 4,280,184) discloses burner flame detection with signals sent through a multiplexer. Donnelly et al (US Patent Application Publication No. 2008/0078337) discloses locking a burner out after a predetermined number of shutdowns within a predetermined time. Wellman (US Patent No. 2,550,507) discloses burner lockout for a heater. And Faulkner (US Patent No. 3,744,954) discloses burner lock-out upon detection of a fuel leak.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Thursday 8:00a.m. to 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/AKC/

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744